MINUTES OF THE MEETING OF THE
S-9 TECHNICAL ADVISORY COMMITTEE
FOR
PLANT GENETIC RESOURCES CONSERVATION AND UTILIZATION
S-9 MULTISTATE RESEARCH PROJECT

A Cooperative Research Project Among:

THE STATE AGRICULTURAL EXPERIMENT STATIONS

OF THE SOUTHERN REGION

and the

U.S. DEPARTMENT OF AGRICULTURE AGENCIES:

AGRICULTURAL RESEARCH SERVICE

COOPERATIVE STATE RESEARCH, EDUCATION AND EXTENSION SERVICE

NATURAL RESOURCES CONSERVATION SERVICE

AUGUST 2-3, 2004

1151 McCARTY HALL
UNIVERSITY OF FLORIDA
GAINESVILLE, FL

SUBMITTED BY

FRED ALLEN, SECRETARY
JORGE MOSJIDIS, CHAIRMAN

Agenda

Monday August 2, 2004, 1151 McCarty Hall, University of Florida Campus

1:00 pm - Call to Order, Dr. Jorge Mosjidis, Chair S-9 RTAC

1:05 pm - Housekeeping details, Ken Quesenberry, Local arrangements host

1:10 pm - Welcome to UF/IFAS, Dr. Mary Duryea Asst. Dean for Research UF/IFAS

1:15 pm - Remarks by Administrative Advisor, Dr. Gerald Arkin

1:30 pm - Remarks by NPGS Staff, Dr. Peter Bretting

1:45 pm - Summary of the year at PGRCU, Griffin, GA, Dr. Gary Pederson

2:15 pm - Presentation by Specific Program at PGRCU # 1, Dr. Brad Morris

2:30 pm - Presentation by Specific Program at PGRCU # 2, Dr. Bob Jarret

2:45 pm - Presentation by Specific Program at PGRCU # 3, Dr. Rob Dean

3:00 pm - Break

3:30 pm - Florida use of plant genetic resources in tomato improvement, Dr. Jay Scott

3:50 pm - Florida use of plant germplasm in fruit improvement, Speaker to be determined

4:10 pm - Florida use of plant germplasm in forage improvement, Dr. Ken Quesenberry

4:30 pm - Florida use of plant genetic resources in peanut improvement, Dr. Barry Tillman

5:00 pm - Adjourn

6:00 pm - Catered dinner @ the home of Dr. Quesenberry, 6828 NW Avenue.

Tuesday morning August 3, 2004

8:00 am - Depart motel for tour of Plant Science Research & Education Unit, Citra, FL

8:30 am - Arrive Citra

Tour will include peanut, sorghum, cotton, corn, perennial peanut, and pigeon pea research with plant genetic resources.

10:30 am - Depart Citra

1151 McCarty Hall

11:00 am - RTAC meeting with brief state presentations.

12:00 noon - Lunch at JW Reitz Student Union Food Court on your own

1:00 pm - Additional RTAC meeting time :00 pm or later if needed - Adjourn

Attendees:

TAC Members:

Jorge Mosjidis, Chair (mosjija@auburn.edu)	Auburn University, AL
Fred Allen (allenf@utk.edu)	University of Tennessee, TN
Mark Hussey (mhussey@tamu.edu)	Texas A&M, TX
Don LaBonte (dlabonte@agctr.lsu.edu)	Louisiana State University, LA
Mari Marutani (marutani@uog9.uog.edu)	University of Guam, GU
Ken Quesenberry (clover@ifas.ufl.edu)	University of Florida, FL
Paul Raymer, (praymer@griffin.uga.edu)	University of Georgia, Griffin, GA
Emerson Shipe (eshipe@clemson.edu)	Clemson University, SC
H. Thomas Stalker (tom_stalker@ncsu.edu)	North Carolina State University, NC
Thomas Zimmerman (tzimmer@uvi.edu)	University of the Virgin Islands, VI.
Gerald F. Arkin, Administrative Advisor (via conference call)	University of Georgia, GA

Griffin PGRCU Staff:

Gary Pederson, (gpederson@ars-grin.gov) Research Leader & Curator Annual Clovers, USDA, ARS

Rob Dean, (rdean@griffin.uga.edu) Geneticist, University of Georgia

Ming Li Wang, (mwang@ars-grin.gov) Research Molecular Geneticist, USDA, ARS

Bob Jarret, (bjarret@griffin.uga.edu) Research Horticulturist/Sweetpotato & Vegetable Crops Curator, USDA, ARS

Brad Morris, (bmorris@ars-grin.gov) Agronomist, Misc. Legumes & New Crops Curator, USDA, ARS

Roy Pittman, (rpittman@ars-grin.gov) Agronomist, Peanut Curator, USDA, ARS,

Other Attendees:

Peter Bretting, USDA-ARS National Program Leader for Germplasm

Mary Duryea, Assistant Dean for Research, IFAS, University of Florida

Ann Marie Thro, (athro@csrees.usda.gov) USDA-CSREES, National Program Staff for Germplasm

Eileen Kabelka, (ekabelka@ifas.ufl.edu) IFAS, FL

Call to Order
The Regional S-9 Technical Advisory Committee (TAC) was called to order at 1:05 PM on Monday, August 2, 2004 by chairperson Dr. Jorge Mosjidis in room 1151 McCarty Hall on the University of Florida campus, Gainesville, FL.

Roll Call
Each person did a self-introduction including their organizational affiliation and their professional responsibilities. Representatives from some states were not present.

Welcome and Opening Remarks
Dr. Gerald Arkin welcomed the group via a conference call from his office in Griffin, GA. He could not attend the S-9 meeting due to an urgent meeting on Monday evening relating to potential funding of a project on the Griffin campus. Dr. Arkin commended Gary Pederson, the curators and staff, and the S-9 Committee for the germplasm repository functioning at its best in many years. He also commented about the relatively stable funding support that the SAES directors have provided over the past few years for conservation and utilization of the germplasm collections. Dr. Arkin reported that the S-9 project is the only "off-the-top" SAES funded project in the southern region. He reviewed the role of the S9 Committee as being (1) providing annual state reports as accountability to the local AES director of germplasm utilization in their state, (2) advise Dr. Pederson and the curators on use and conservation of germplasm, and (3) lobby the local state AES director for continued investment in this program.

Dr. Mary Duryea, Assistant Dean for UFL/IFAS, welcomed the group to campus and to Florida. She stated that agriculture was a major source of revenue to Florida, $60 billion annually in agriculture products, second only to tourism. She also stated that IFAS was firmly committed to plant breeding and to germplasm use and conservation. She also stated that UFL had plans to add a $10 million building dedicated to genetic research and education.

Dr. Ken Quesenberry, 2004 host for the meeting, added his welcome to the group and covered local arrangement details.

PGRCU Overview
Dr. Gary Pederson gave a presentation (Appendix 1) covering the activities and improvements of the Plant Genetic Resources Conservation Unit (PGRCU) at Griffin during the past year. He reviewed the mission of PGRCU as well as the progress that had been made in backing up the various plant collections since 1996. Dr. Pederson also reported on the domestic and foreign distributions of germplasm from the unit during the past year. Additionally, he reported on the status of funding, staffing, equipment purchases, facilities acquisitions, repairs and maintenance. The committee commented on the continued positive leadership and improvements to the unit under Dr. Pederson's tenure as research leader.

Legumes and Miscellaneous Crops:
Dr. Brad Morris made a presentation (Appendix 2) on status of regeneration and backup on various specialty uses (e.g., ornamental and human health) of some legume species such as winged bean, sesame, castor bean (ricin), water chestnut, and Crotolaria (protein and fiber).

Vegetable Crops and Sweetpotato
Dr. Bob Jarret described (Appendix 3) the addition of an enhanced descriptor process of taking digital photos which embody 37/42 descriptors such as whole plant, fruit, and flowers regenerating. He reported that his program was regenerating ~150 accessions/year. He highlighted some of the work being done with okra (digital images), sweet potato (tissue regeneration), and watermelon (regeneration of heirloom varieties for storage in CO).

Molecular Lab
Dr. Rob Dean reported (Appendix 4) that the most recent molecular marker work had been focused on morphological traits and disease resistance genes in sorghum germplasm. The core collection of sorghum has been characterized for several traits.

Examples of Germplasm Use in University of Florida Programs
Dr. Eileen Kabelka, Cucurbit Breeding & Genetics**,** presented background information on important cucurbits in FL such as watermelon, cucumbers, squash and pumpkins. She reported that the market is driven by consumer preferences of size, color, flavor and seedless fruit (watermelon). Traits important in breeding new varieties to meet consumer preferences are disease resistance, fruit quality, uniformity, yield, and nutritional attributes. She cited an example of exotic germplasm utilization in the FL watermelon breeding program of using wild bitter gourd and wild species to obtain disease resistance. Another example she cited was using attributes of squash germplasm accessions and pedigree information to decide which material to use in crosses aimed at new variety development.

Dr. Ken Quesenberry, Forage Legume Breeding, distributed copies of three publications, *New Plants for the South* (1961), *Value of University of Florida Forage Legume Cultivars to Livestock Production* (1999), and *New Plants for Florida* (2003) that reviewed some of the history of the use of germplasm accessions in crop improvement and variety development for numerous crops that are important in Florida agriculture. Dr. Quesenberry briefly discussed the impact that plant breeding programs have had on FL's agricultural economy.

Dr. Barry Tillman, Peanut Breeding, discussed some of the history and goals of FL's peanut improvement program. He reported that the genetic base of the runner type varieties trace back to approximately 13 PI's. He indicated that the market demands flavor and uniformity and as such the market is dominated by a few varieties such as Florunner and GA Green. These have been driving factors for a narrow genetic base. Dr. Tillman reported that much of the utilization of plant introductions in breeding come through sources of disease and pest resistance (e.g., PI 209336 used as a resistant parent for tomato spotted wilt virus in peanut).

National Overview
Due to flight delays and cancellations, Dr. Peter Bretting was unable to be present for the afternoon meeting but joined the group later in the day. **Dr. Ann Marie Thro** gave a general overview of the National Plant Germplasm System as follows:
I. Background: The National Plant Germplasm System, NPGS, includes:
- 4 multi-state projects (S-9, W-6, NE-9, NC-7) which are multi-crop collections
-6 more single crop collections

-the National Center for Genetic Resources Conservation, in Ft. Collins CO
-the Genetic Resources Information Network
-and many other sites and units.
The NPGS is funded primarily by ARS (>90%). ESCOP* participates in the NPGS through regional funds to the 4 multi-state projects and off-the-top funds to one of the single-crop collectors (potatoes, NRSP-6). **ESCOP participates in planning and management of the NPGS via SAES directors who serve as Administrative Advisors: one director per region for the multi-state projects and four directors who serve as AA-s for NRSP-6. Collaboration between ESCOP and ARS provides increased management options and flexibility to the projects, and leverages additional funding and in-kind support.

*ESCOP: Experiment Station Committee on Policy. ESCOP is composed of directors of State Agricultural Experiment Stations (SAES).
**ESCOP funding varies from 8% to 22% depending on the project

II. The NPGS is more valuable today than at any previous time.
$ Molecular tools improve management efficiency and give new power to gene discovery using the collections
$ Consumers are increasingly interested in variety and quality in foods. NPGS collections will be the source of new consumer traits to take advantage of this new market.
$ More restrictions and costs apply to international collecting of plant germplasm; international inventions will limit access in future.
$ Germplasm is recognized by the Federal Government as important for national food security

III. Current challenges
$ Federal funding is expected to be flat or declining for some time.
$ ESCOP interest in making funding available to new initiatives
$ Potential for piece-by-piece dis-investment of ESCOP-s participation in NPGS before there is a long-term plan for ESCOP-s engagement with NPGS in future (may limit opportunities)

IV. ESCOP and the NPGS - future and long-term
Should ESCOP continue to be engaged with planning and management in the NPGS? If so, what mechanisms are available to ESCOP for continued involvement? The present system (4 multi-state projects and 1 NRSP):
$ Has strong regional support for some projects
$ Has proven to be an effective way for SAES involvement to add value to the germplasm collections and get them into plant breeding programs and other research, producing benefits for science, educators, farmers and consumers
$ May be the optimum mechanism for the future - or - there may be other options that fix ESCOP-s long-term plans

Tuesday, August 3, 2004
The group traveled to Citra, FL and toured the **Plant Sciences Research and Education Unit.** The tour highlighted the peanut, sorghum, cotton, corn, perennial peanut, pigeon pea,

horticultural and ornamental research being conducted on the station as well as some of the research facilities and equipment.

S9 RTAC Meeting Resumed

Chairman Jorge Mosjidis reconvened the group at 11:10 a.m., August 3, 2004 in room 1151 McCarty Hall. **Dr. Peter Bretting** presented the National Program Staff Report with the activities at the national level (Appendix 2). He reviewed: (1) the general budget situation for NPGS sites, (2) NP reviews, (3) public stakeholder meeting results, and (4) international germplasm issues. He announced that all of the RTAC's would be invited to meet with the National Program group in Ames, IA in 2006.

Committee Members Discussions

Discussion focused on suggestions that could help the unit and the whole system make an even more efficient use of the resources available. (1) Dr. Tom Zimmerman recommended that the CGC reports be sent to S-9 TAC members at least one week prior to the annual meeting. This would allow time for committee members to review the accomplishments and status of each project and be in a better position to make helpful suggestions. Dr. Pederson stated that attempts would be made to meet this request in the future. (2) Dr. Tom Stalker asked Dr. Pederson about upcoming constraints for the overall program. Dr. Pederson addressed four areas: (a) land availability on the Griffin campus is on a year-to-year basis. The solution may be to lease 17 acres across from existing land on the Westbrook farm. On that property there is a need for well for irrigation, pump house and fencing. Dr. Pederson stated that there is land available in Bryon and at some other stations in GA, but the problem is distance. (b) Equipment - some need for additional pollination cages, (c) additional herbarium specimens of species, especially for grasses. (d) lists of major priority needs for each curator- needs vary by curators. Some use equipment that reduces labor loads; however, many labor needs are met by shifting farm crew members from one project to another at peak labor demands.

Dr. Stalker requested that next year Dr. Pederson provide the committee with a list of priorities for equipment and other needs of the program. Dr. Mosjidis commented that this would be very useful for the S9 TAC members to provide support for the Unit and helping the Unit stay on course. Dr. Stalker reiterated that the purpose of the TAC is give advice.

Dr. Mari Marutani asked if the digital photos could be entered into the GRIN network. Dr. Pederson reported that the GRIN data information was entered by a separate group in Beltsville, MD.

Tobacco Germplasm Collection

Dr. Tom Stalker brought up the issue regarding the tobacco germplasm collection that is being maintained at NC State University. For the past several years, NCSU has maintained the collection of ~2000 accessions + 200 species. The current dilemma is that the person who has served as the curator is departing and there is no person or program to take over the collection. The U.S. Congress has taken the stand that no federal money can go to support tobacco research, even though most of the basic research focuses on tobacco as a model plant or focuses on medical - pharmaceutical research using tobacco as a bio-factory. After some discussion a ***motion*** was made by Hussey and seconded by Allen that ***the S-9 TAC recommends that the***

USDA take back the tobacco collection from NC State. The motion passed. The USDA-ARS representatives abstained from the vote. It was recommended that the Director of NC State Experiment Station take the action item to the next SAES directors meeting for their thoughts and action (especially the tobacco states).

Business Session

K. Quesenberry moved to approve the minutes as distributed and Zimmerman seconded. The motion passed. Mosjidis moved and Zimmerman seconded that Emerson Shipe be elected as secretary and Fred Allen as chair for the 2005 S-9 TAC meeting. The motion passed. The location for the 2005 meeting was discussed and F. Allen volunteered to host the meeting in 2005. Quesenberry moved and Shipe seconded that the meeting will be held in TN in 2005, preferably during the first week of August.

The group thanked Dr. Quesenberry for hosting the meeting, and the participating FL faculty for their presentations.

Yearly reports from the S-9 TAC were distributed. State representatives were encouraged to complete one if they hadn't done so. Each report should include yearly activities, impact and publication.

Meeting was adjourned 12:15 (Hussey/Stalker)

Minutes recorded by Fred Allen, Secretary

Appendix 1

DR. GARY PEDERSON

PLANT GENETIC RESOURCES: CURRENT STATUS

Plant Genetic Resources: Current Status

Gary A. Pederson

USDA, ARS, Plant Genetic Resources Conservation Unit

Griffin, GA

Outline

- PGRCU mission
- Current status of each crop
- Progress made
  - Project plans and security assessments
  - Funding
  - Staffing
  - Equipment and facilities
  - Germinations
  - Other activities

What is the mission of PGRCU?

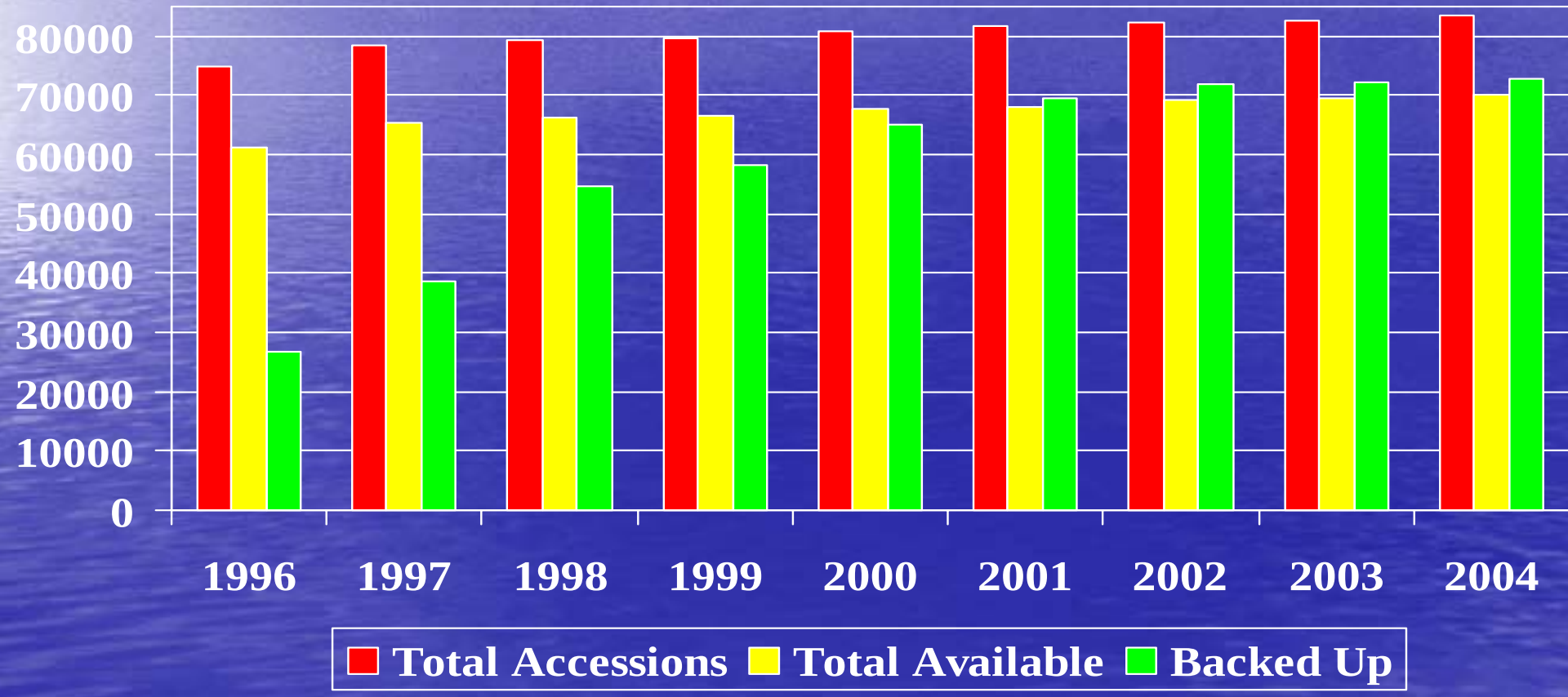
- Plant Genetic Resources Conservation Unit (PGRCU) exists to conserve plant genetic resources for users today and for future generations.
- Mission: “acquire, characterize, maintain, evaluate, document, and distribute plant genetic resources”.
- This is what users of the genetic resources maintained at Griffin expect from the Unit.

PGRCU Collection - June 2004

- Total Accessions
  - 83,601
- Total Available
  - 70,160 (83.9%)
- Backed Up
  - 72,921 (87.2%)

Acknowledgement: Merrelyn Spinks and Lee Ann Chalkley, PGRCU, compiled and summarized all numbers shown in this presentation.

PGRCU Collection 1996 - 2004



Vigna

CURATOR	CROP	TOTAL ACCESSIONS	TOTAL AVAILABLE	NUMBER BACKED UP	ITEMS SHIPPED IN 2003
Graves Gillaspie	Cowpea	8,032	5,609	6,197	471
	Mung bean	4,195	3,833	4,095	3
	Other Vigna spp.	603	263	298	21

Vegetable Crops & Sweetpotato

CURATOR	CROP	TOTAL ACCESSIONS	TOTAL AVAILABLE	NUMBER BACKED UP	ITEMS SHIPPED IN 2003
Bob Jarret	Cucurbits	2,036	920	1,330	611
	Eggplant	970	892	923	732
	Okra	3,001	1,536	1,920	449
	Peppers	4,582	3,809	3,855	3,614
	Sweetpotato - tissue culture	748	708	573	332
	Other Ipomoea spp.	448	205	180	245
	Watermelon	1,671	1,604	1,638	5,220

Legumes and Misc. Crops

CURATOR	CROP	TOTAL ACCESSIONS	TOTAL AVAILABLE	NUMBER BACKED UP	ITEMS SHIPPED IN 2003
Brad Morris	Castor bean	373	261	357	405
	Kenaf & Roselle	338	292	309	125
	Legumes	3,508	2,649	2,734	554
	Miscellaneous	137	101	122	65
	Sesame	1,204	1,190	1,204	1,626

Warm-Season Grasses

CURATOR	CROP	TOTAL ACCESSIONS	TOTAL AVAILABLE	NUMBER BACKED UP	ITEMS SHIPPED IN 2003
Melanie Newman	Bamboo	98	98	50	116
	Grasses	6,711	5,925	5,972	553
	Pearl millet	1,086	1,053	1,069	99

Clover and Sorghum

CLOVER CURATOR/ SORGHUM COORDINATOR	CROP	TOTAL ACCESSIONS	TOTAL AVAILABLE	NUMBER BACKED UP	ITEMS SHIPPED IN 2003
Gary Pederson	Annual Clover	2,119	1,467	1,524	483
	Sorghum	31,822	29,148	30,035	34,783

Peanuts

CURATOR	CROP	TOTAL ACCESSIONS	TOTAL AVAILABLE	NUMBER BACKED UP	ITEMS SHIPPED IN 2003
Roy Pittman	Cultivated Peanuts	9,136	7,943	8,328	412
	Wild Peanuts	784	654	208	74

Digital photos

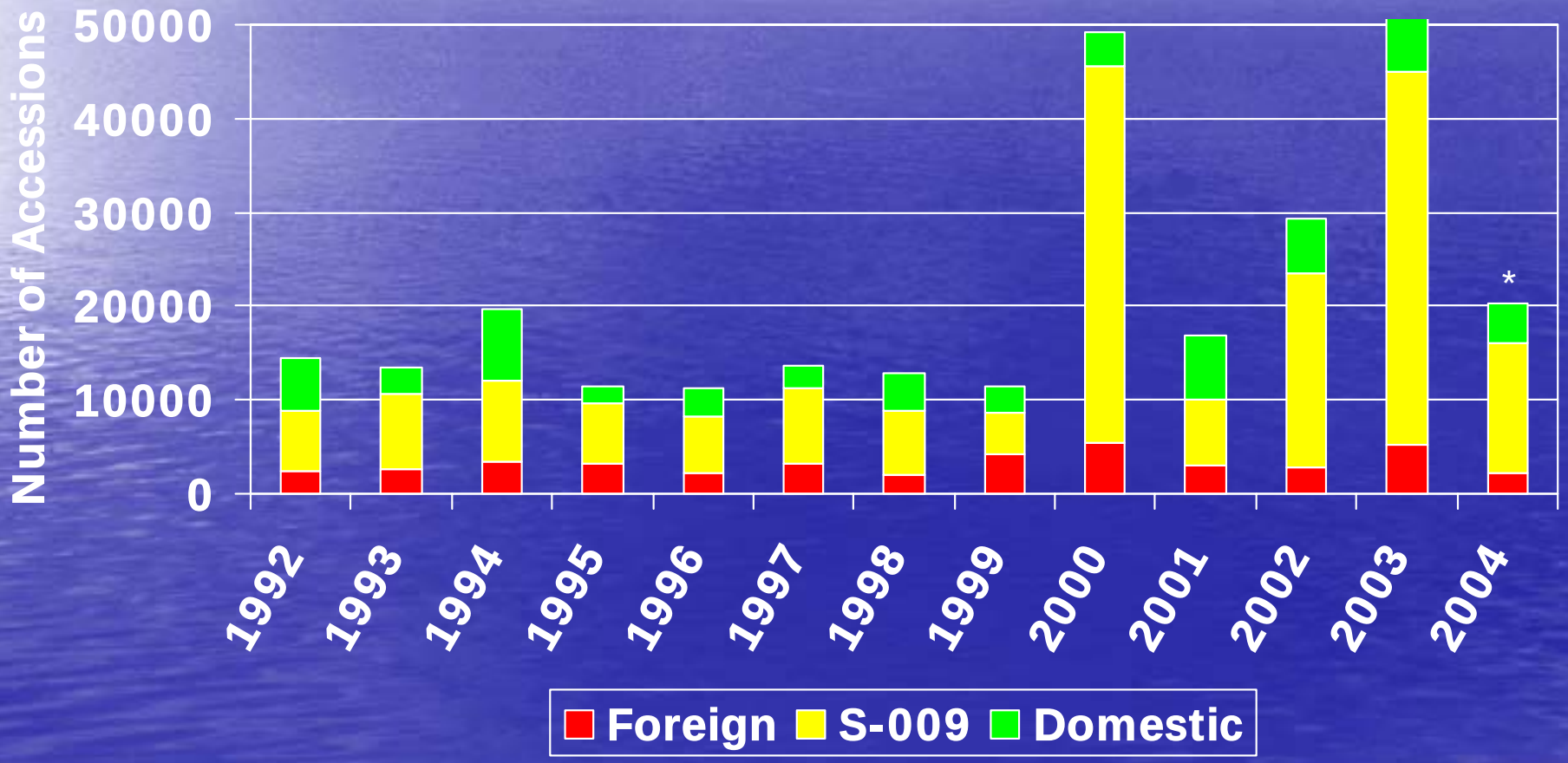
Requested for regeneration in CY2003

Crop	# accessions	Crop	# accessions
Cowpea	261	Castor bean	13
Sorghum	2,774	Grasses	147
Cucurbit	37	Kenaf	3
Clovers	69	Legumes	310
Ipomoea sp.	27	Misc. crops	3
Eggplant	6	Sesame	28
Peppers	715	Cult peanut	803
Watermelon	154	Wild peanut	14

Distributions in CY2003

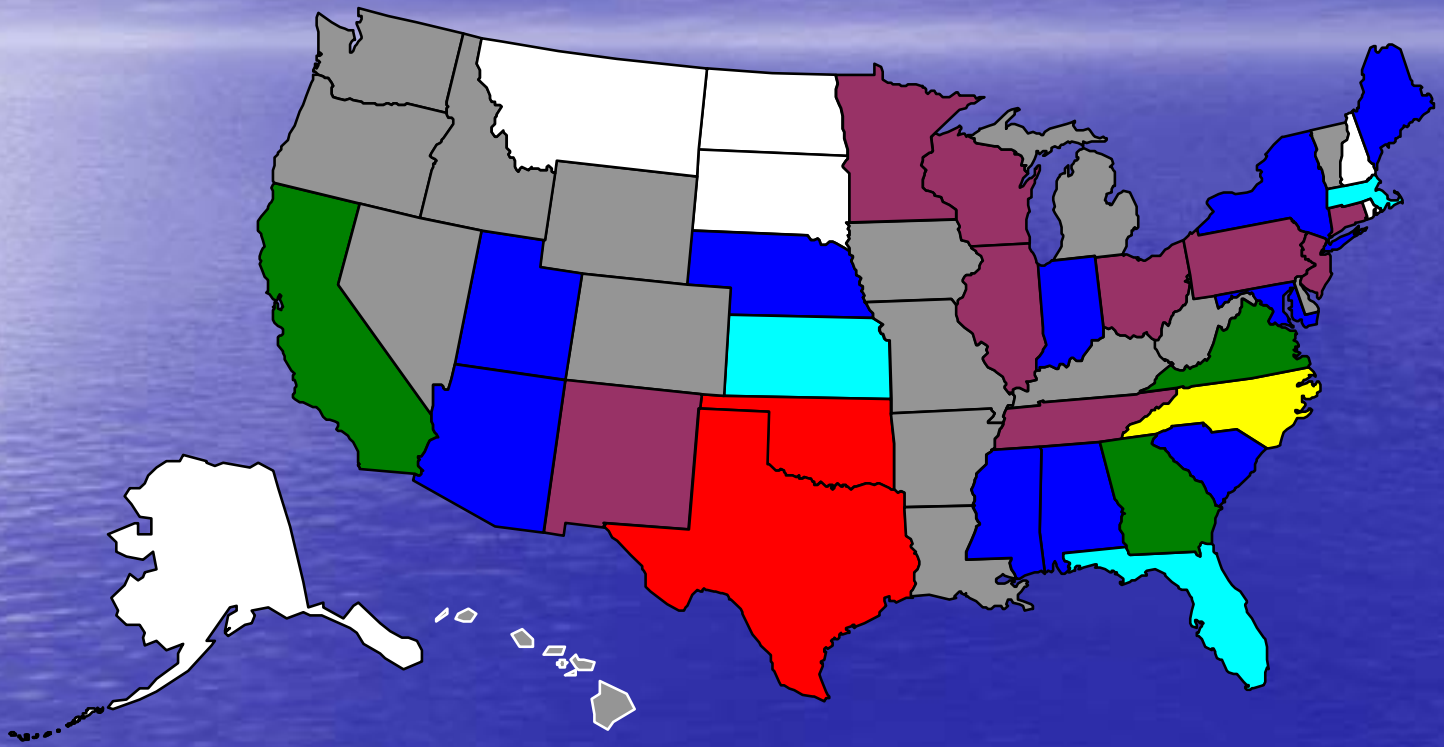
- Domestic = 45,751 items in 490 orders
  - S-9 region = 39,825 items
- Foreign = 5,244 items in 92 orders
- Total CY2003 distributions = 50,995 items

Distributions to S-009 Region



* As of July 29, 2004

Domestic Distributions in CY2003



Total number of accessions by state

7,500 to 25,000	1,000 to 2,499	50 to 99
5,000 to 7,499	500 to 999	1 to 49
2,500 to 4,999	100 to 499	0

2003 Distributions

corn State University, Angelo State University, Arizona State University, Auburn University, Brigham Your
University, California State University at Fresno, Chicago State University, Cornell University, Essex
Community College, Georgetown University, Harvard University, J.C. Raulston Arboretum, Kansas Stat
University, Louisiana State University, Miami University, Mississippi State University, New Mexico State
University, North Carolina State University, Northern Arizona University, Ohio State University, Oklahon
Medical Research Foundation, Oklahoma State University, Oregon State University, Parkland College, Pur
University, Reedley College, Texas A&M University, Texas A&M University at Dallas, Texas Tech Univers
Tuskegee University, University of Arkansas, University of Arkansas at Pine Bluff, University of Californi
University of California at Davis, University of California at Riverside, University of Central Oklahoma,
University of Connecticut, University of Florida, University of Georgia, University of Houston at Victoria
University of Illinois at Urbana-Champaign, University of Kansas, University of Kentucky, University of Ma
University of Michigan, University of Minnesota, University of Missouri, University of Missouri at St. Lou
University of Nebraska, University of New Mexico, University of Puerto Rico, University of Tennessee,
University of Tennessee at Martin, University of Utah, University of Washington, University of Wisconsin
Madison, University of Wyoming, Utah State University, Virginia Polytechnic Institute, Virginia State
University, Washington State University, West Virginia University, Western Illinois University, Agricultur
Research Service United States Department of Agriculture, Abbot and Cobb Inc, AgResearch Consultan
Inc, Agro Farms, American Cotton Breeders Inc, Arcadia Biosciences, Botanicals of Patience, Byotix Inc
Conway Seeds, Crop Docs Research and Consulting Ltd, Danson Seed Company, Deatriste Seeds, Elmo
Growers, General Mills Inc, Goose Creek Nursery, Harris Moran Seed Company, HyTech Research and
Breeding, Kan-Do Plant Breeding Services, Landmark Seed Company, Lexicon Genetics Incorporated,
London Spring Farms, Milo Genetics, Morrison Farms, Oak Gate Farm, Patriot Seed Company, Pendergra
Produce and Seed, Philip Morris USA, Phylogix Inc, Pioneer Hi-Bred International Inc, Redwood City Se
Company, Sakata Seed America Inc, Seminis Vegetable Seeds Inc, Stoney Forensic Inc, Sunseeds,
Southwest Ohio Pepper Growers, Syngenta Seeds Inc, The Dow Chemical Company, Triple J Produce In
Triumph Seed Company Inc, Walt Disney World Company, Warner Seeds Inc, Wellness Farm, Federa
Correctional Institute in Florida, US Army SBCCOM in Maryland, Natural Resources Conservation Servic
United States Department of Agriculture, Calvin Center, Cold Spring Harbor Laboratory, Creative Alternat
Center, Eastern Native Seed Conservancy, Elder Flower Farm, Farmer Cooperative Genome Project, Lie
Academy, Magnolia Garden Club, Rare Vegetable Seed Consortium, School Districts of Hillsborough Cou
Florida, Seed Savers Exchange, Thanksgiving Farm at the Center for Discovery, The Cucurbit Network, T
Land Institute, The Range Sustainability Project, The Samuel Roberts Noble Foundation

Foreign Distributions in CY2003

Argentina	China	Guam	New Zealand	South Africa
Australia	Czech Republic	India	Niger	South Korea
Belgium	Ecuador	Israel	Portugal	Spain
Bolivia	Egypt	Japan	Puerto Rico	Thailand
Botswana	Finland	Jordan	Saudi Arabia	Turkey
Brazil	France	Lebanon	Sierra Leone	Ukraine
Canada	Germany	Netherlands	Slovenia	United Kingdom

Progress

- Project Plans approved in 2003
  - ARS Project Plan – NP 301 (5 years)
  - S-009 Project (10 years)
- Response to Security Reviews in 2003
  - OIG Audit
    - developing seed disposal methods
    - updating NPGS and Location operations manuals
  - USDA “Tiger Team”
    - personnel security investigations
    - ARS Homeland Security

PGRCU Funding

- ARS base funding increases
  - FY2001 = $349,370 (President and Congress)
  - FY2002 = $225,000 (Congress)
- ARS temporary funding increases
  - FY2004 = $46,000 (pollination cages, seed cleaning equipment, germinator)

Total PGRCU Funding

- ARS base funding
  - FY2004 = $2,169,079
- S-009 base funding
  - FY2004 = $396,631
- Budget situation
  - ARS salary calculation

Staffing - S-009

- Six permanent S-009 employees
  - Verlene Byous and Amos Mack retired
- 15 temporary full-time and part-time employees were hired during FY2004 to handle specific labor needs.

Staffing - ARS

- ARS positions filled in last year
  - Noelle Barkley (Mol Biol support scientist)
  - Judy Hendrix (Administrative tech)
  - Veronica Riddick (Secretary)
  - Regina Estes (Peanut tech)

Staffing - ARS

- Currently have 1 ARS position to fill
  - Agric Sci Res Technician (vegetable crops)
  - Computational Biologist (Cat. 4 scientist) abolished.
  - Two term positions abolished when completed in 2005.
- Supervisor training
  - USDA Graduate School “Supervision and Group Performance” (5 supervisors)
  - SAA Human Resources Management training (11 supervisors)

Staffing summary

- When vacant position is filled, current staff will be 35 employees (29 ARS and 6 S-009)
  - including two term ARS positions until 2005
- Additional 10-15 temporary labor positions
- *Historical perspective: In Jan. 2001, full staff was ~28 permanent employees (18 ARS and 10 S-009)*

Equipment purchased

- Seed processing
  - Seedburo Lab brush machine for cleaning grass seeds (NPS)
  - Almaco seed cleaning machine for misc. legumes
- Seed storage
  - Movable storage shelves for -18 C freezer cold room to maximize storage space (SAA)

Seed storage in -18 C cold room

Old storage shelves

Movable storage shelves
-18 C cold room

Equipment purchased

- Germination program
  - New seed germinator (NPS)
- 100 new pollination cages for pepper increases (NPS)

Equipment purchased

- Molecular lab
  - Agilent HPLC system (NPS)
  - GeneAmp 9700 PCR
  - iCycler Thermal Cycler
- Plant pathology lab
  - UV-Vis Spectrophotometer
  - Ultra-pure deionized water system

HPLC

Facilities

- Field operations
  - Truck body used for pollination cage storage
  - New metal machine shed (60’ x 100’) located at Westbrook farm about 1 mile from station

Pollination cage storage

Facilities: New Machine Shed

Facilities: Leases

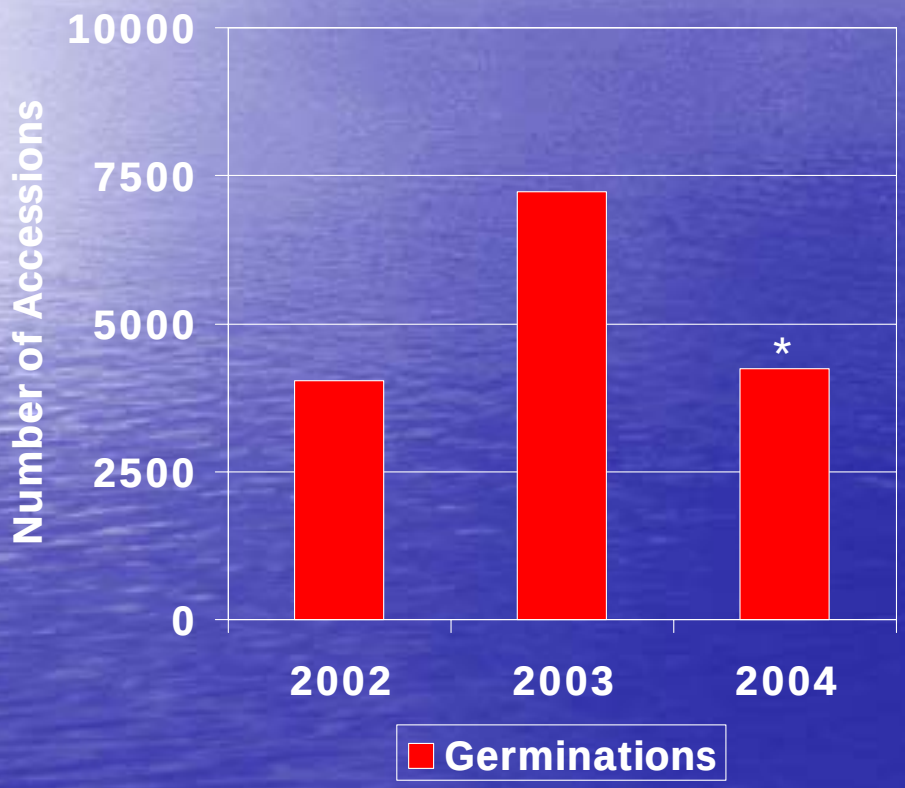
- ARS leases with University of Georgia
  - Old PI building (germination and grass greenhouse)
  - Seed storage building (large 4C and -18C cold rooms)
  - S-9 building (Jarret's labs and sweetpotato tissue culture)
  - Existing 11 acres and new machine shed on Westbrook Farm
  - Developing 17 acres on Westbrook Farm
- Existing ARS leases with University of Georgia
  - Redding building (molecular labs and offices)
  - Land on Griffin campus where ARS buildings are located

Facility Repair and Maintenance

- Replaced all shingles and removed old vents from roof of seed processing building
- Replaced a number of greenhouse roof panels
- Replaced screens in quarantine greenhouse
- Replaced all screens in screenhouse
- Installed three storage cages in storage building
- Will replace drain line in seed processing bathroom

ARS screenhouse

Germinations



* As of July 29, 2004

- Since 2002, germination data have been obtained on 15,352 accessions at Griffin.
- Germination data (from Griffin or NSSL backups) are now available for 94.8% of accessions in Griffin collection.

Other activities

- Georgia Peanut tour at Griffin Sept 3, 2003
- GRIN Site meeting at Griffin May 18-19, 2004 with representatives from most NPGS sites.
- Detail in Beltsville, MD, as acting National Program Leader, Grain Crops, in March and April 2004.
- Presentation at BIO2004 in San Francisco on “Plant Genetic Resource Collections: Importance to Biotechnology” in June 2004 during session on DNA banking.

Plant Genetic Resources Conservation Unit

Appendix 2

DR. BRAD MORRIS

CURATION AND RESEARCH IN THE SPECIAL-PURPOSE LEGUMES, NEW, AND MISCELLANEOUS CROPS

Curation and Research in the Special-Purpose Legumes, New, and Miscellaneous Crops

- Brad Morris, Agronomist, Curator
- Gus Taylor, Federal Technician
- Clarence Lee, UGA Technician
- Evan Butts, UGA Student

Collaborators

- Dr. Ming Li Wang, USDA, ARS, PGRCU
- Dr. Kim Moore, AgResearch Cons., Inc.
- Dr. James McArthur, Phylogix, Inc.
- Dr. Sandra Kays, USDA, ARS
- Dr. Kenneth Hensley, Okla. Med. Res. Fou.

Special-Purpose Legumes

Legumes – 2,929 accessions

Winged bean – 164 accessions

Senna angulata, PI 322312

Canavalia ensiformis, PI 337078

New and Miscellaneous Crops

- **Sesame (Sesamum indicum)**
- **Castorbean (Ricinus communis)**
- **Guar (Cyamopsis tetragonolobus)**
- **Kenaf (Hibiscus spp.)**
- **Miscellaneous (Catharanthus, Abutilon, water chestnut)**

New Crops
Sesame, PI 153514

Kenaf, Hibiscus cannabinus, PI 248898

Castorbean, Ricinus communis, PI 165446

Miscellaneous Crops, Catharanthus roseus, PI 608581

Regeneration (500/yr)
Based on low viability, 10 yrs. old or older, need, and importance

Winged bean, Psophocarpus tetragonolobus

Curation Research, Waterchestnut regeneration successes

Quantification of Protein from Crotalaria juncea Accessions

- PI 314239 - 44.2%
- PI 250486 - 43.5%
- PI 295851 - 43.1%
- PI 250487 - 42.8%
- PI 207657 - 42.3%
- PI 248491 - 42.0%
- PI 346297 – 41.5%

Quantification of Total Dietary Fiber from C. juncea Accessions

PI 189043	51.7%
PI 234771	44.7%
PI 322377	44.2%
PI 391567	43.3%
PI 561720	42.8%
PI 426626	42.7%

Quantifying FRIL Lectin from Lablab purpureus Accessions

- **GRIF 1246 - 0.19%**
- **PI 387994 - 0.17%**
- **PI 392369 - 0.13%**
- **PI 338341 - 0.12%**
- **PI 509114 - 0.11%**
- **PI 164302 - 0.10%**
- **PI 388019 - 0.10%**

Sesame Accessions Quantified for Sesamin Content

- **Sesamin is a major lignan in sesame oil and reported to prevent liver damage from alcohol and shown to be an antioxidant.**

- **PI 543241 - 332 ug/ml**
- **PI 247855 - 276 ug/ml**
- **PI 163595 - 268 ug/ml**
- **PI 200111 - 216 ug/ml**
- **PI 298630 - 213 ug/ml**
- **PI 549265 - 213 ug/ml**
- **PI 561704 - 201 ug/ml**

Guar Evaluation for Use as a Nutraceutical Crop at Ashburn, GA, AgResearch Consultants, Inc.

Future Curation-Research

Using SSR's and Morphological Markers for Variability

- **Lablab purpureus**
- **Guar**
- **Relatives**
- **Sesame**

Appendix 3

DR. BOB JARRET

S-9 VEGETABLE CROPS GERMPLASM

S-9 Vegetable Crops Germplasm

Capsicum, spp. Germplasm Collection

- Total # of accessions = ~4,000
- Total number of spp. = 10
- Number of Related Genera = 2

Morphological descriptors

- Currently 42 morphological descriptors using a modified version of the IPGRI descriptor list.
- Very few descriptors on fruit quality attributes (capsaicin, reducing sugars, etc.)
- Many descriptors are most useful for spp. identification, and less so for characterizing variation within spp.

Preliminary studies revealed significant (3-fold) variation in the concentrations of sucrose, glucose and fructose in a small (100 genotypes) sample of the collection.

Photo of Flowers (= X descriptors)

Provides data on 7 descriptors including:

- Peduncle length
- Anther color
- Corolla color
- Corolla spots
- Filament color
- Flowers per axil
- Pedicel position at anthesis

Photo of whole and cut fruit (= XX descriptors)

Provides data on 17 descriptors including:

- Peduncle insertion
- Immature and mature fruit color
- Immature fruit color
- Calyx margin
- Calyx shape
- Fruit neck constriction
- Fasiculation
- Fruit corkiness
- Blossom end shape
- Fruit length & width
- Fruit shape
- Locule number
- Wall thickness
- Seed color
- Commercial category
- Anthocyanin (immature fruit)
- Fruit persistence

Photo of whole plant (= XX descriptors)

Provides data on 13 descriptors including:

- Determinant habit
- Plant habit
- Fruit set
- Accession uniformity
- Dwarfism
- Stem number
- Stem color
- Node anthocyanin
- Stem anthocyanin
- Stem pubescence
- Leaf pubescence
- Leaf texture
- Fruit position

Data for all descriptors except:

- Fruit weight
- Pungency
- Male sterility
- Days to maturity
- Cotyledon color

can theoretically be obtained in three images.

Photo of fruit on plant
(close-up = XX descriptors)

Why Record Images?

- To document phenotypes with a specificity that can't readily be accomplished using descriptors alone.
- Permit users to more readily visualize the 'big picture'
- Useful for (re)classification
- Evaluation of potential mixes
- Verification of trueness-to-type in subsequent regenerations
- Visualization of quantitative differences (e.g. fruit yield)
- Images can be acquired opportunistically and data transferred when convenient
- Data can be checked for accuracy at a later date without the need to regrow the accession
- Resolve discrepancies between multiple data sets without the need to regrow the accession

Drawbacks in the use of digital images alone for characterization.

- Inability to search image files for some characteristics.

Future Plans (*Capsicum*):

1. Digital documentation of all *Capsicum* accessions:

   2003 - all *C. baccatum*

   2004 - all *C. frutescens* (Griffin), *C. pubescens* (Griffin) + *C. chinense* (Naples, FL). AVRDC materials (Baja)

   2005 - all *C. annuum*?

Future Plans (*Capsicum*):

2. Sorting out accession mixes:

   C. annuum - ~ 25% mixes

   C. baccatum - ~ 20% mixes

   C. chinense - ~ 30% mixes

   C. frutescens - ~ 20% mixes

Future Plans (*Capsicum*):

3. Increase seed for ensured availability:
   - Currently ~ 95% are available
   - Regeneration rate = 50 accessions/yr
   - Anticipate 5 to 6 years to ‘complete’ regeneration

Future Plans (*Capsicum*):

4. Continue efforts to record ‘key’ characteristics on
   - *C. annuum*, *C. chinense* and *C. frutescens* accessions in order to assist in accurate identification of spp.

Collaborators

Syngenta Vegetable Seeds

Seminis Vegetable Seeds

Redland City Seed Company

Capsicum CGC

Abelmoschus spp. (okra and related spp.)

Issue: Large number of uncharacterized accessions in need of regeneration with no obvious basis for prioritization of regeneration of specific genotypes.

Action: Grow out and document (digital images) large nos. of accessions (few plants/accession).

Images (and other data) will be used as the basis for prioritizing future seed regeneration.

Sweetpotato (*Ipomoea batatas* and related spp.)

Issue: Prolong reculture cycle (*I. batatas*) and continue regeneration of related *Ipomoea* spp.

Action: Research being conducted on alternative media formulations for prolonging the reculture cycle, and

Use of alternative strategies for GH regeneration of related spp. including cages and insect pollinators.

Citrullus (watermelon and related spp.)

Issue: Many heirloom varieties recently transferred to Griffin from Fort Collins.

Action: Increase regeneration numbers of *C. lanatus* in 2005 + 2006.

Cucurbita moschata (squash) and misc. cucurbits.

Issue: Backlog of accessions of *C. moschata* awaiting regeneration and lack of information on cultural requirements for regeneration of misc. cucurbits.

Action: Develop alternative strategies for regulating growth of *C. moschata* permitting an increase in plant density, and

Continue collaboration with Parlier, CA and Mayaguez, PR to identify appropriate environmental conditions conducive to seed production from various misc. cucurbits.

Appendix 4

DR. ROB DEAN

SORGHUM: TO BI OR NOT TO BI


Sorghum
To bi or not to bi


Presentation by:
Rob Dean
University of Georgia

Overview

John E Erpelding

Tropical Crops and Germplasm Research

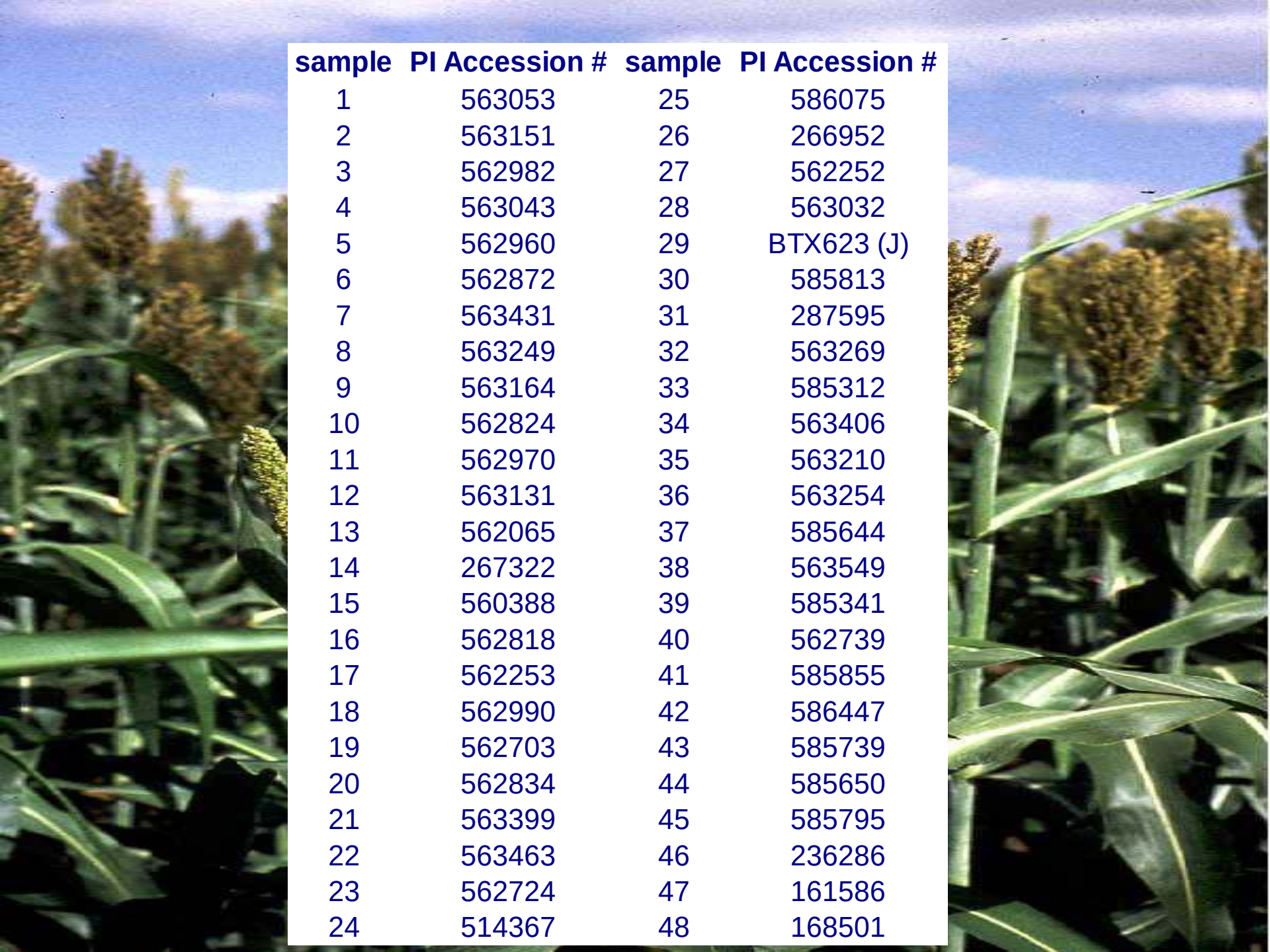
- Introduce, increase, maintain, characterize, evaluate, and conserve sorghum germplasm in the National Plant Germplasm System.
- Develop and characterize collection subsets to assess genetic diversity for sorghum improvement.
- **Evaluate genetic diversity for disease resistance in sorghum germplasm subsets.**

- http://sorghumgenome.tamu.edu/Mapping/Markers/SSR.html#21
- 10 linkage groups (A-J)
- 40 EST Sorghum SSR primer sets

Xtxp-325	GGGGCGACTCTTTGTAAAACATA	ATCGTGTCACTATCTACATCTAAATCGG
Xtxp-88	CGTGAATCAGCGAGTGTTGG	TGCGTAATGTTCCTGCTC
Xtxp-279	ATTCTGACTTAACCCACCCCTAAA	AGCTCATCAATGTCCCAAACC
Xtxp-46	GGGCAATCTTGATGGCGACAT	AGGTGTGGCTCGGGGAGAAC
Xtxp-63	CCAACCGCGTCGCTGATG	GTGGACTCTGTCGGGGCACTG
Xtxp-201	GCGTTTATGGAAGCAAAAT	CTCATAAGGCAGGACCAAC
Xtxp-100	CCGGCCGGCCAACCAACCAC	TGCCCCAACGCTCACGCTCCC
Xtxp-8	ATATGGAAGGAAGAAGCCGG	AACACAACATGCACGCATG
Xtxp-266	GTTGTCTAGTATAGCAAGGTGGG	ATAATAGTAGATGCGTGTCAAAAGAA
Xtxp-33	GAGCTACACAGGGTTCAAC	CCTAGCTATTCCTTGGTTG
Xtxp-114	CGTCTTCTACCGCGTCCT	CATAATCCCACTCAACAATCC
Xtxp-69	ACACGCATGGTTTGACTG	TTGATAATCTGACGCAACTG
Xtxp-12	AGATCTGGCGGCAACG	AGTCACCCATCGATCATC
Xtxp-24	CCATTGAGCTTCTGCTATCTC	TTCTAAGCCCACCGAAGTTG
Xtxp-212	TTTCCCCTCTTTCTTGTGTC	CTCGGCGTCGTCGTA
Xtxp-21	GAGCTGCCATAGATTTGGTCG	ACCTCGTCCCACCTTTGTTG
Xtxp-40	CAGCAACTTGCACTTGTC	GGGAGCAATTTGGCACTAG
Xtxp-312	CAGGAAAATACGATCCGTGCCAAGT	GTGAACTATTCGGAAGAAGTTTGGAGGAAA
Xtxp-92	ACTTGCAGGTTAATTTCGTCC	GGCGAGCTTGCGGTAG
Xtxp-168	AGTCAAAACCGCCACAT	GAGAAGGGGAGAGGAGAA
Xtxp-339	CCGCACTCTCCACTCT	CGGAACACAGGGAAGG
Xtxp-10	ATACTATCAAGAGGGGAGC	AGTACTAGCCACACGTCAC
Xtxp-287	GCAAGCGAGCTGACTTATGTAACGAGA	CAAAGTGCTACTAAACCTATGCAGGGTGAA
Xtxp-289	AAGTGGGGTGAAGAGATA	CTGCCTTTCCGACTC
Xtxp-20	TCTCAAGGTTTGATGGTTGG	ACCCATTATTGACCGTTGAG
Xtxp-270	AGCAAGAAGAAGGCAAGAAGAAGG	GCGAAATTATTTTGAAATGGAGTTGA
Xtxp-331	AACGGTTATTAGAGAGGGAGA	AGTATAATAACATTTTGACACCCA
Xtxp-141	TGTATGGCCTAGCTTATCT	CAACAAGCCAACCTAAA
Xtxp-273	GTACCCATTTAAATTGTTTGCAGTAG	CAGAGGAGGAGGAAGAGAAGG
Xtxp-210	CGCTTTTCTGAAAATATTAAGGAC	GATGAGCGATGGAGGAGAG
Xtxp-354	TGGGCAGGGTATCTAACTGA	GCCTTTTTCTGAGCCTTGA
Xtxp-105	TGGTATGGGACTGGACGG	TGTTGACGAAGCAACTCCAAT
Xtxp-6	ATCGGATCCGTCAGATC	TCTAGGGAGGTTGCCAT
Xtxp-317	CCTCCTTTTCCTCCTCCTCCC	TCAGAATCCTAGCCACCGTTG
Xtxp-176	TGGCGGACATCCTATT	GGAGAGCCCGTCACTT
Xtxp-17	CGGACCAACGACGATTATC	ACTCGTCTCACTGCAATACTG
Xtxp-65	CACGTCGTCACCAACCAA	GTTAAACGAAAGGGAAATGGC
Xtxp-303	AATGAGGAAAATATGAAACAAGTACCAA	AATAACAAGCGCAACTATATGAACAATAAA
Xtxp-225	TTGTTGCATGTTGGTTATAG	CAAACAAGTTCAGAAGCTC
Xtxp-262	TGCCTGCCCGACCTG	TTGCTGTCTCCGCTTTCC
Xtxp-41	TCTGGCCATGACTTATCA C	AAATGGCGTAGACTCCCTTG

96 accessions

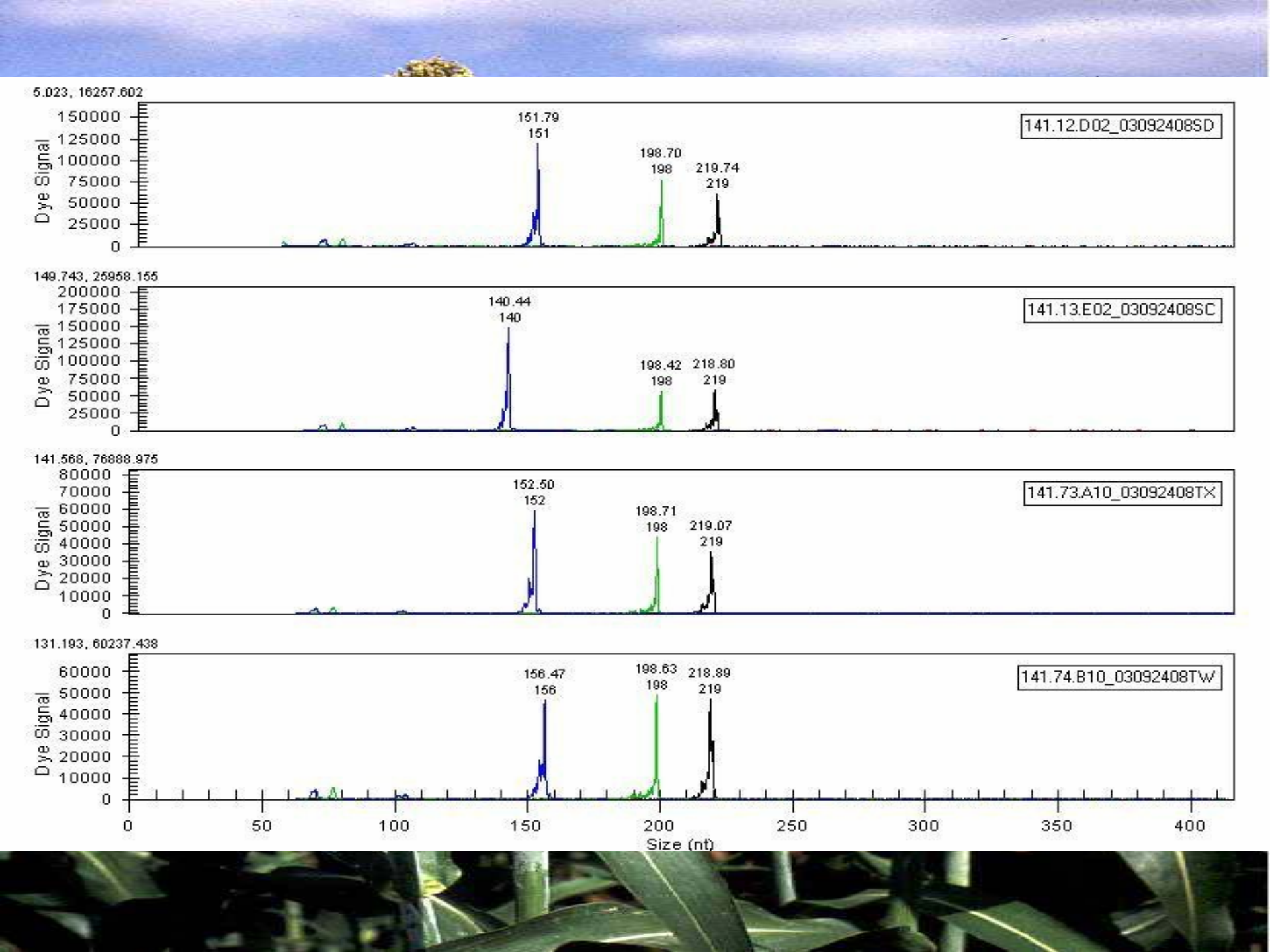
- Screened the Germplasm Resources Information Network (GRIN), using the core sorghum collection, for complete phenotypic descriptors.



sample	PI Accession #	sample	PI Accession #
1	563053	25	586075
2	563151	26	266952
3	562982	27	562252
4	563043	28	563032
5	562960	29	BTX623 (J)
6	562872	30	585813
7	563431	31	287595
8	563249	32	563269
9	563164	33	585312
10	562824	34	563406
11	562970	35	563210
12	563131	36	563254
13	562065	37	585644
14	267322	38	563549
15	560388	39	585341
16	562818	40	562739
17	562253	41	585855
18	562990	42	586447
19	562703	43	585739
20	562834	44	585650
21	563399	45	585795
22	563463	46	236286
23	562724	47	161586
24	514367	48	168501

sample	PI Accession #	sample	PI Accession #
49	564163=BTx623	73	267519
50	ATX3042 (J)	74	267515
51	ATX623 (J)	75	267447
52	585787	76	291382
53	586482	77	297129
54	195039	78	453035
55	170794	79	297094
56	291377	80	453831
57	291237	81	453691
58	291236	82	513996
59	253640	83	455013
60	248336	84	514120
61	229861	85	514015
62	197542	86	267633
63	221728	87	282829
64	229850	88	287598
65	253632	89	284971
66	248334	90	267643
67	267410	91	287597
68	266955	92	287578
69	267106	93	285194
70	267461	94	266063
71	267442	95	514140
72	267593	96	521702

	1	2	3	4	5	6	7	8	9	10	11	12
A	563053	563164	562253	586075	585312	585855	564163	291237	253632	267519	453691	284971
B	563151	562824	562990	266952	563406	586447	ATx3042	291236	248334	267515	513996	267643
C	562982	562970	562703	562252	563210	585739	ATx623	253640	267410	267447	455013	287597
D	563043	563131	562834	563032	563254	585650	585787	248336	266955	291382	514120	287578
E	562960	562065	563399	564163	585644	585795	586482	229861	267106	297129	514015	285194
F	562872	267322	563463	585813	563549	236286	195039	197542	267461	453053	267633	266063
G	563431	560388	562724	287595	585341	161586	170794	221728	267442	297094	282829	514140
H	563249	562818	514367	563269	562739	168501	291377	229850	267593	453831	287598	521702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Dye Signal
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141.13.E02_03092408SC
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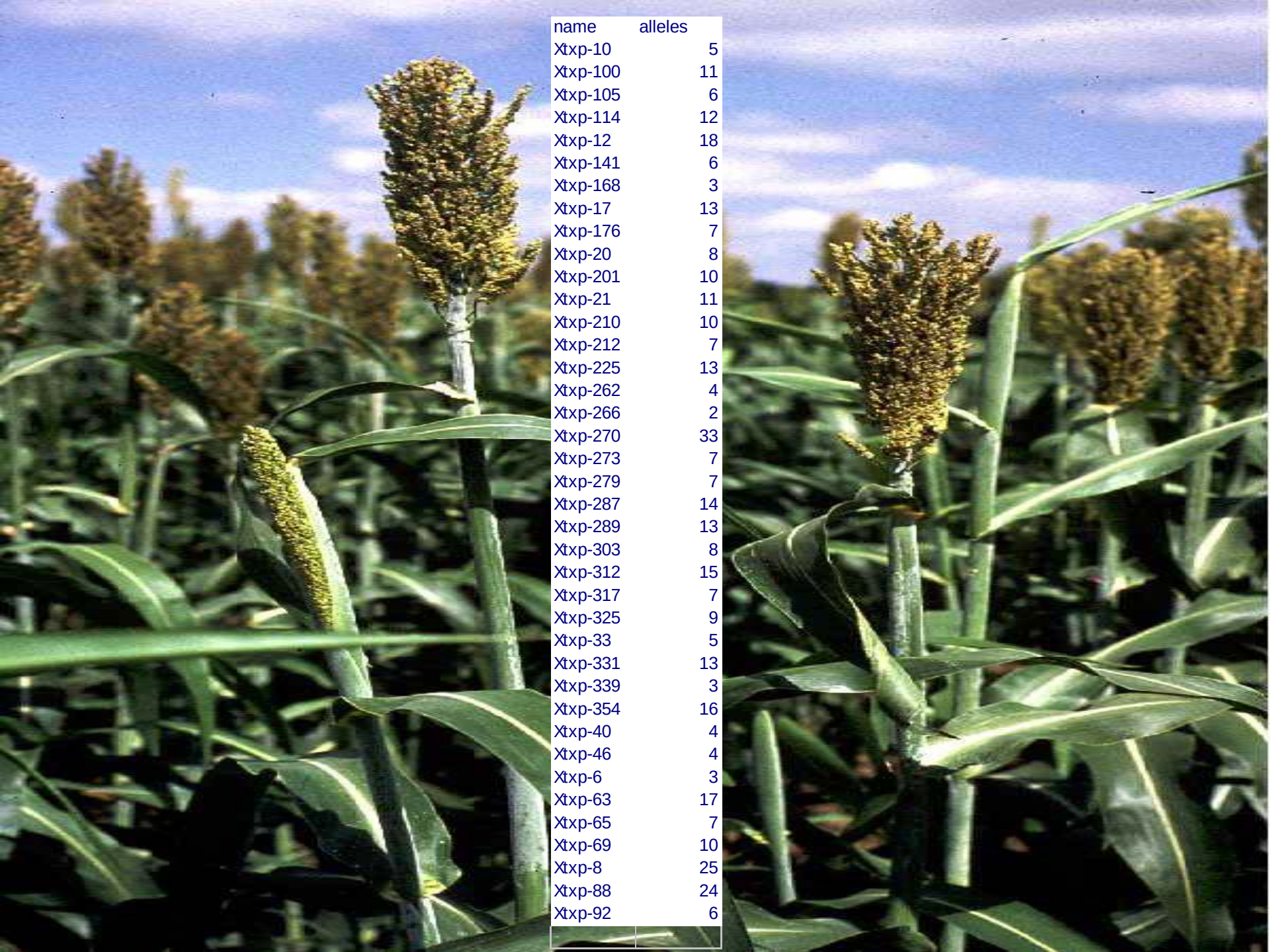

name	alleles
Xtxp-10	5
Xtxp-100	11
Xtxp-105	6
Xtxp-114	12
Xtxp-12	18
Xtxp-141	6
Xtxp-168	3
Xtxp-17	13
Xtxp-176	7
Xtxp-20	8
Xtxp-201	10
Xtxp-21	11
Xtxp-210	10
Xtxp-212	7
Xtxp-225	13
Xtxp-262	4
Xtxp-266	2
Xtxp-270	33
Xtxp-273	7
Xtxp-279	7
Xtxp-287	14
Xtxp-289	13
Xtxp-303	8
Xtxp-312	15
Xtxp-317	7
Xtxp-325	9
Xtxp-33	5
Xtxp-331	13
Xtxp-339	3
Xtxp-354	16
Xtxp-40	4
Xtxp-46	4
Xtxp-6	3
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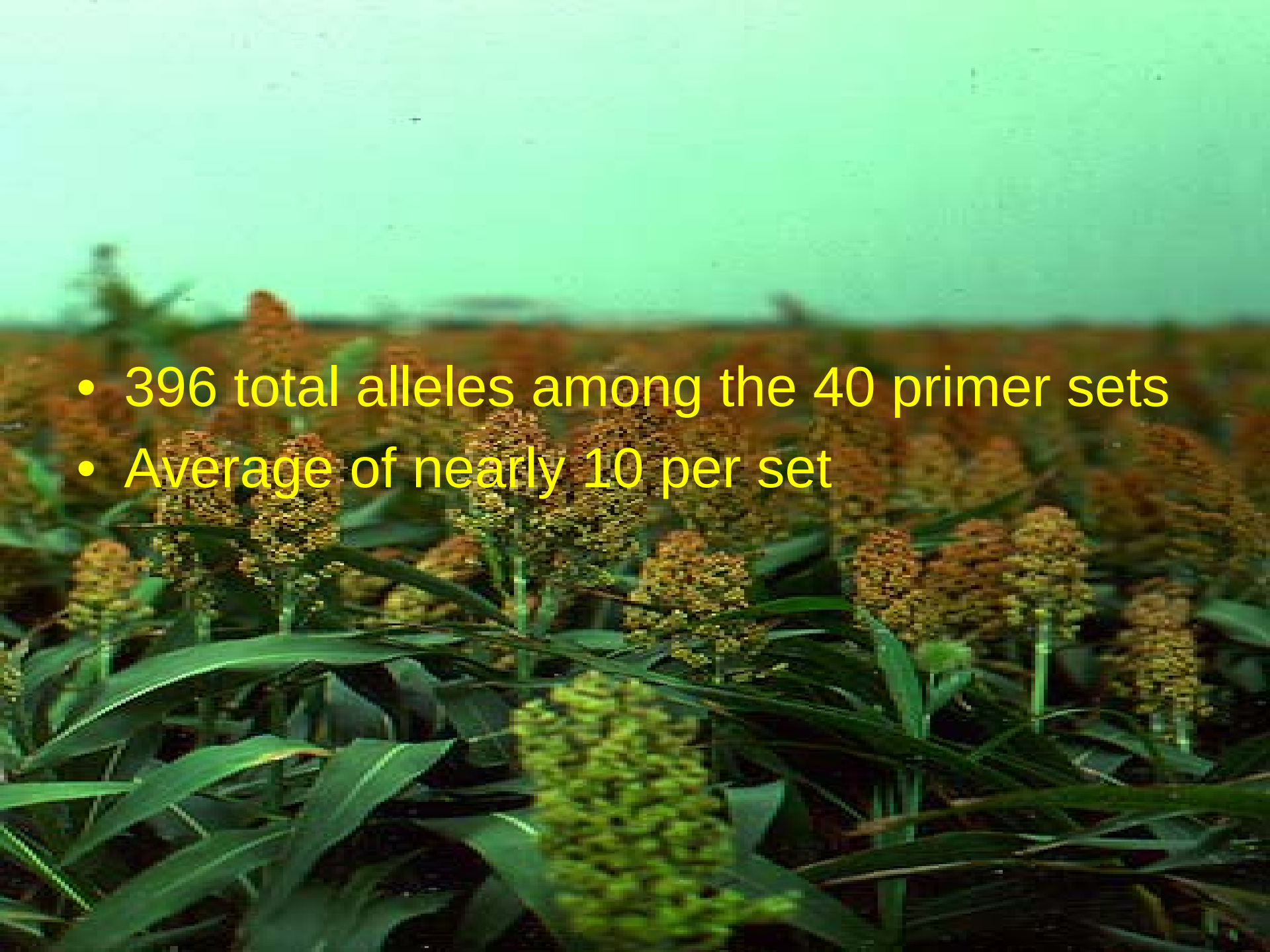
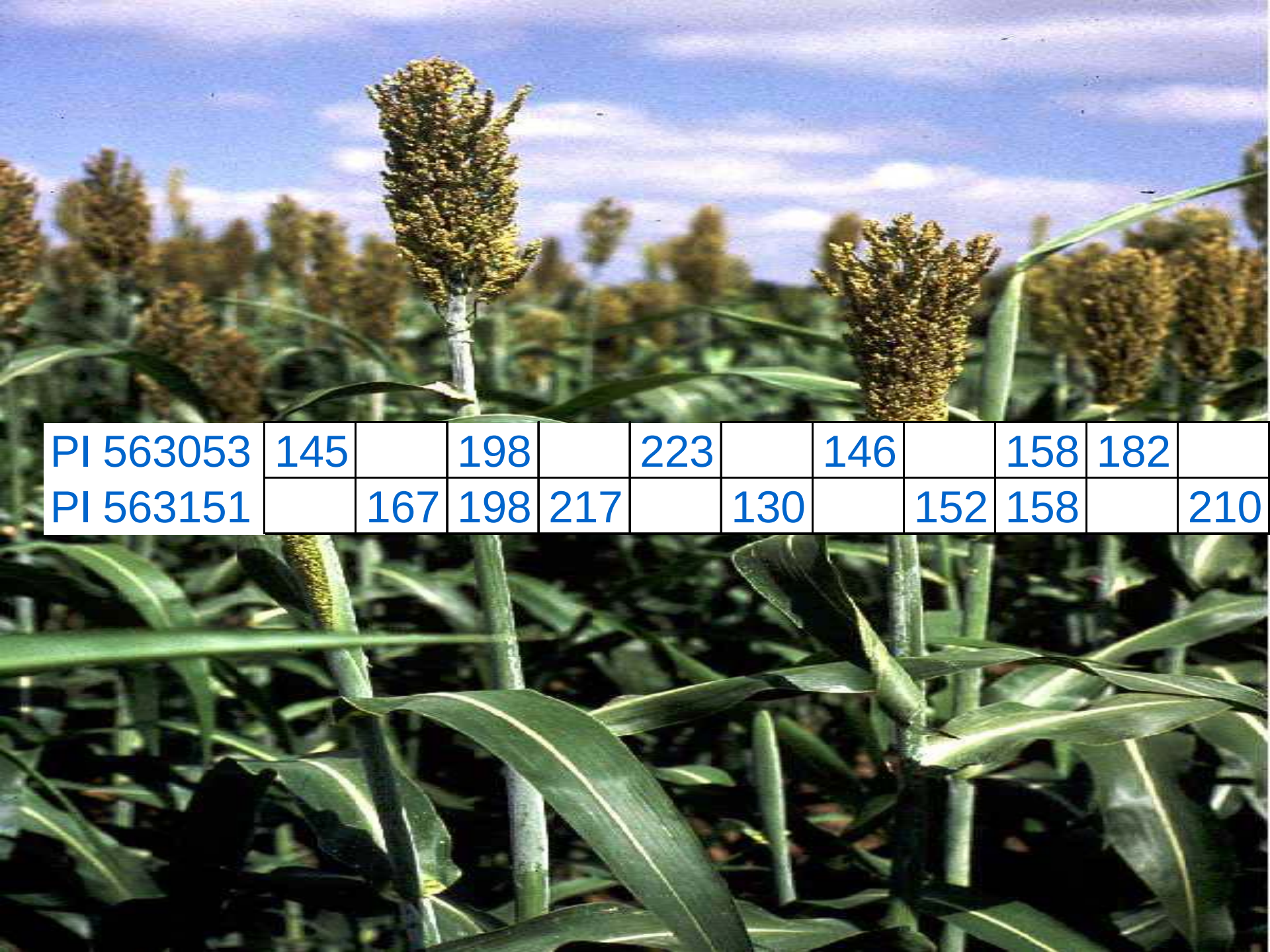
Xtxp-65	7
Xtxp-69	10
Xtxp-8	25
Xtxp-88	24
Xtxp-92	6



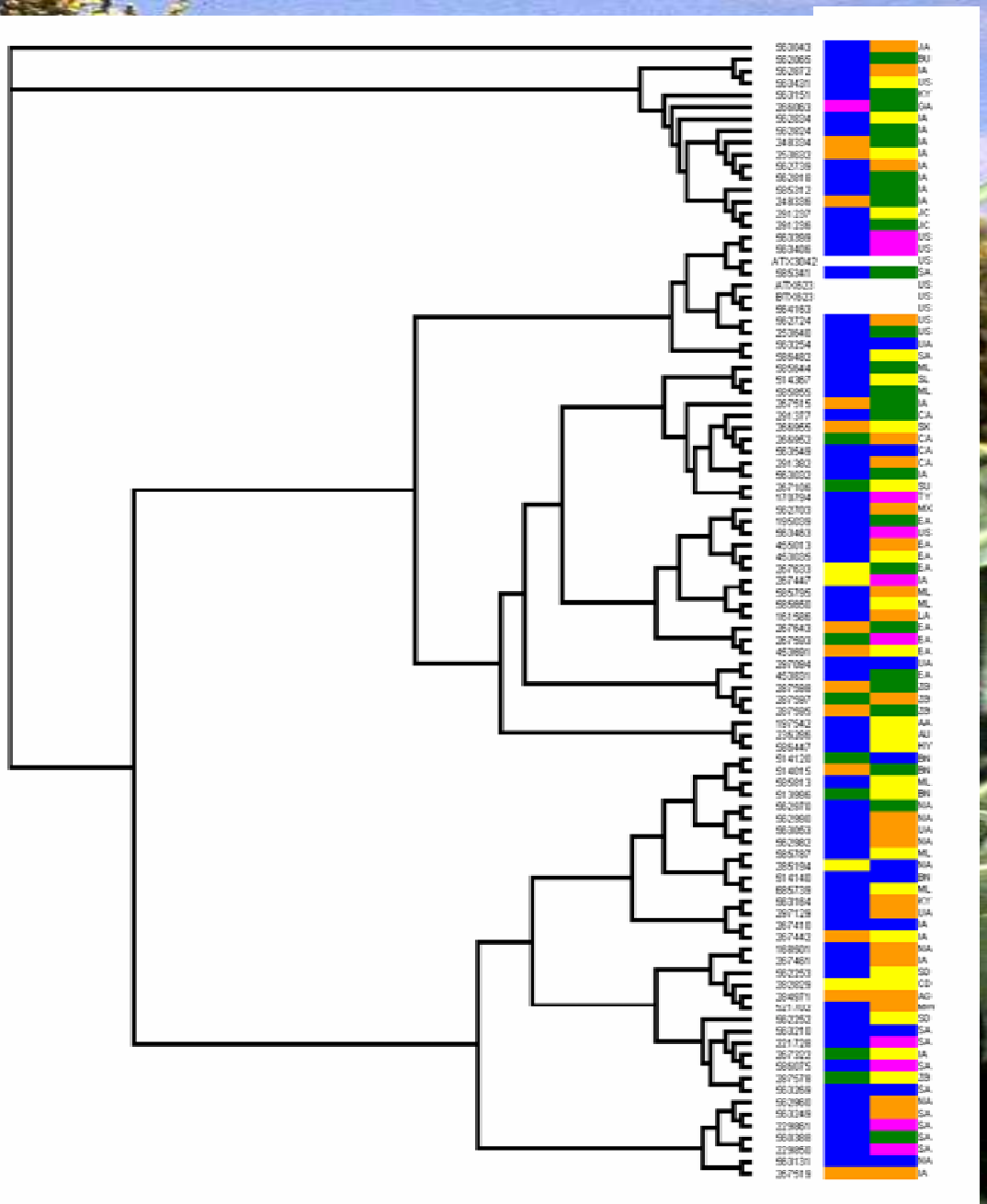
- 396 total alleles among the 40 primer sets
- Average of nearly 10 per set



PI 563053	145		198		223		146		158	182	
PI 563151		167	198	217		130		152	158		210

SSR TREE

	Highly resistance
	Resistance
	Intermediate
	Susceptible
	Highly susceptible



MORPHOLOGY AND DISEASE RESISTANCE

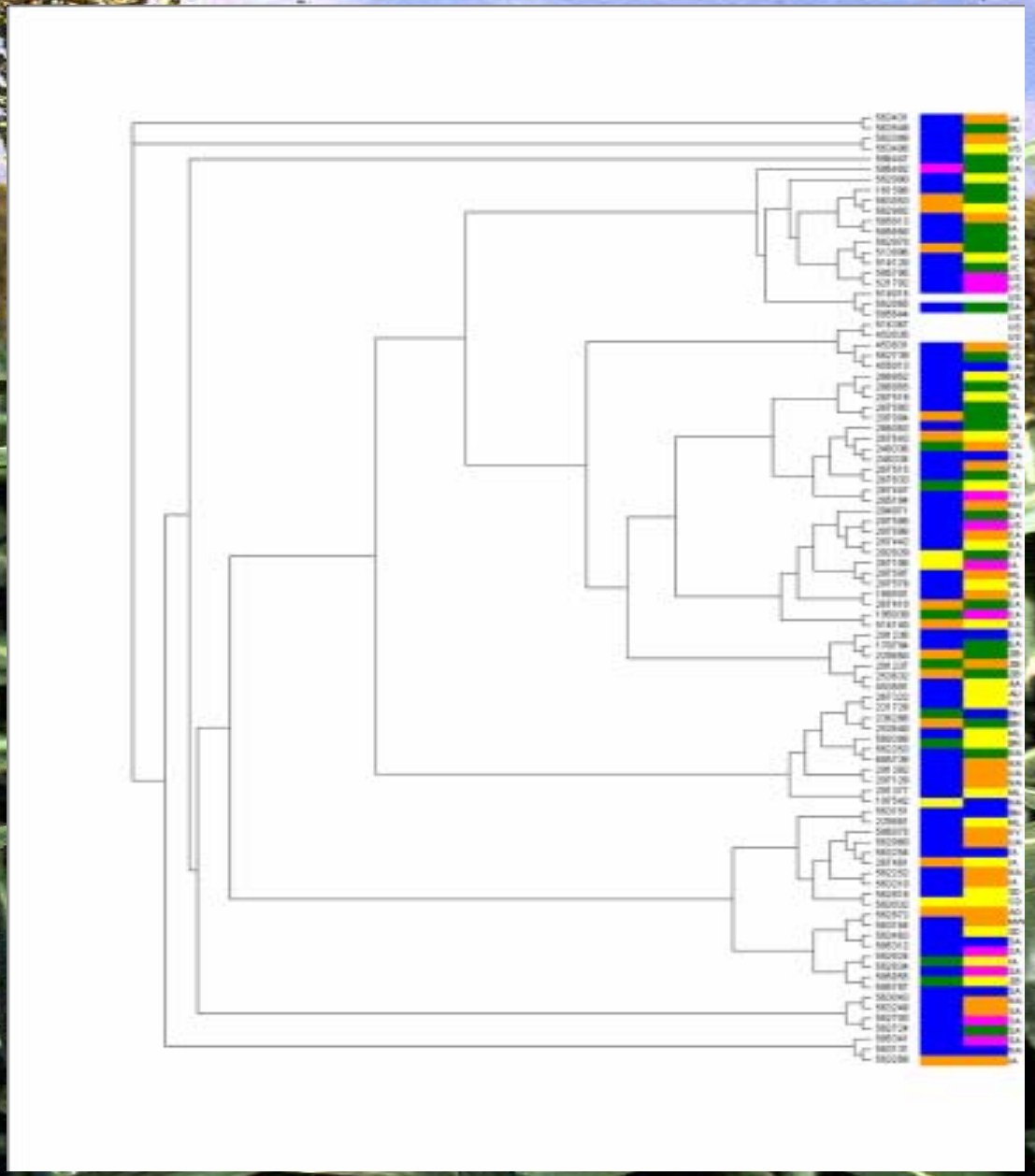
- **40 or so descriptors in GRIN**
- **Many are environment dependent (plant height)**
- **Many are complete, especially for the core**

MORPHOLOGY AND DISEASE RESISTANCE

- **Endosperm Texture (5)**
- **Flowering Rating (6)**
- **Race (19)**
- **Grain Weathering (5)**
- **Rust (5)**
- **Anthracnose (5)**

Morphology Tree

	Highly resistance
	Resistance
	Intermediate
	Susceptible
	Highly susceptible



Where to go

Not surprisingly the SSR tree grouped according to geography.

I plan on further examining grouping according to working group classification.

Where to go

Continue to look for disease resistance via trends. Many more morphological descriptors on GRIN to work through


LAMBORGHINI
WWW.SZCARS.COM